



## *Automotive Immunity Tests*

*Transient Specialists is your single source provider for renting EMI/EMC compliance testers for IEC, EN, Automotive, Telecom and UL Standards.*

*With our competitive rental plans, you have the choice of weekly or monthly rental terms, on a wide variety of calibrated test generators, which can be at your facility tomorrow.*

*Our dedicated technical staff will assist you in identifying your needs and give you advice on the test set-up and equipment operation.*

### ***Rental Equipment Designed To Meet the Following Standards***

- *Commercial Standards – The EN / IEC 61000-4 series of EMI tests for ESD, EFT, Bi-wave Surge, Dips and Interrupts, 100khz ring wave, and conducted RF tests. CEMark testing.*
- *ANSI Standards – The ANSI C62.41, C62.45 including the bi-wave and ring wave tests. The 1 Meg. Damped oscillatory test per ANSI C37.90.1*
- *Military Standards – The equipment to generate the transients per Mil. Std 461, CS115 and CS116. Also, the conducted RF requirements of CS114*
- *Automotive Standards – The ISO 7627-2 series of EMI tests including waveforms 1-5 and 7. The equipment includes preprogrammed software for many of the manufacturer specific test requirements*

### **Testing Standards**

#### ***International Electrotechnical Commission (IEC) Standards***

*IEC promotes standardization in the fields of electricity, electronics and related technologies.*

##### ***IEC 61000-4-2***

*Electrostatic discharge (ESD), it requires a 150pf/ 330 ohm discharge network, air discharge tests up to 15kv, contact mode tests up to 8kv. The Keytek MZ-15 by Thermo Fischer Scientific can meet this requirement.*

##### ***IEC 61000-4-4***

*Electrical fast transient (EFT), 5/50 nanosecond impulses in bursts with a duration of 15 ms and a period of 300ms with voltages up to 4000 volts as measured into a 50 ohm load. The Keytek EMC-Pro, EMCPro Plus, the Keytek ECAT system with an E411 or E412 module, or the Keytek CEMaster can meet this requirement.*

##### ***IEC 61000-4-5***

*Lightning and voltage surges, defined by the combination wave (or bi-wave, it is defined as an*

*open circuit voltage waveform of 1.2/50 microseconds and a short circuit current waveform of 8/20 microseconds, with voltages up to 4000 volts. The Keytek EMC-Pro, the Keytek ECAT system with an E501 or E510 module, or the Keytek CEMaster can meet this requirement.*

#### **IEC 61000-4-8**

*Power frequency magnetic field test, the EMC-Pro and CEMaster can meet this requirement. The H-Coil is also available.*

#### **IEC 61000-4-9**

*Pulse magnetic field test, it has an 8/20 microsecond current waveform. The EMC-Pro and CEMaster can meet this requirement. The H-coil is required and available to rent.*

#### **IEC 61000-4-11**

*AC mains dips and interrupts test, also known as “power quality failure” test. This test requires dips of 40 and 80%, as well as, 0% short and open. The Keytek EMC-Pro, CEMaster, and the ECAT system with the EP62 meet this requirement.*

#### **IEC 61000-4-12**

*Oscillatory ring wave tests at 100khz and 1Mhz. The Mig-OS-OS1 manufactured by EMC Partners will meet this standard.*

### **Glossary**

#### **Air Discharge**

*A type of ESD testing that requires a rounded (finger shaped) tip which approaches the equipment under test until the ESD event occurs through the air. It is a more realistic test, but it can be difficult to replicate results, because the humidity and the speed of approach can affect the impact of the ESD voltage on the EUT.*

#### **Bellcore GR-1089**

*Refers to a specification for telecommunication equipment written by the organization formerly known as Bell Labs. Transient tests called for in this standard include 10×1000, and 2×10 at various voltage and current levels. Some of the KeyTek ECAT system modules used for testing to this standard are the E506, E508, E509, and E518.*

#### **Bi-wave**

*Also known as the combination wave- It has a voltage waveform of a 1.2 microsecond rise time and a 50 microsecond fall time. It has a current waveform of an 8 microsecond rise time and 20 micro-second fall time. It is used to meet IEC 61000-4-5 and ANSI/IEEE 62.41.*

#### **CDE or Cable Discharge Event**

*This refers to a test specification for ESD testing that simulates an ESD event caused by contact of an ESD sensitive device with a charged cable.*

#### **CDM or Charged Device Model**

*This refers to a test specification for ESD testing that among other things simulates a field*

*induced ESD event on an ESD sensitive device. Integrated circuits are typically tested to 500 volts at the device level using this model.*

#### **EFT**

*Electrical Fast Transients are bursts of very fast pulses associated with opening of a switch or activation of a gaseous discharge (fluorescent lights). Rise times in the nanoseconds.*

#### **EMC**

*Electromagnetic Compliance, regulations relating to the interference in the operation of equipment caused by electrical voltages, currents, or fields. There are regulations relating to the emission of these electrical anomalies by the equipment under test and there are regulations relating to the immunity of the equipment under test to these electrical anomalies.*

#### **EMI**

*Electromagnetic Immunity, regulations requiring that equipment can continue to function in a changing electrical environment.*

#### **ESD**

*Electrostatic Discharge is usually due to frictional charging. Rise times are less than one nanosecond, and energy is lower than for the EFT or Surge waveforms.*

#### **Thermo Keytek**

*Thermo Scientific, formerly Keytek, manufactures a wide range of test equipment for immunity testing to the IEC61000-4 series of tests and the Telcordia GR1089 telecom tests. Transient Specialists has the largest selection of their product line available for rental in the United States. We have lightning surges up to 10 kilovolts, EFT bursts up to 8 kilovolts, and couplers which can handle power requirements of up to 600 volts, 32 amps, three phase.*

#### **Teseq**

*Teseq, formerly Schaffner Test Systems, plays a leading role in the manufacture of EMC test systems for the consumer and industrial electronics sectors. Transient Specialists carries the NSG3040, all-in-one, surge, EFT and dips and interrupts test system for CE applications. One of their best sellers, it won the "Best in Test" finalist designation for 2010.*

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